

10/712,808  
Proposed New Independent Claim  
August 13, 2007

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IN THE UNITED STATES  
PATENT AND TRADEMARK OFFICE

PATENT APPLICATION

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Examiner: Jeffrey Michael WOLLSCHLAGER

Title: Polymerization Welding and Application to  
Microfluidics

Commissioner for Patents  
P.O. Box 1450  
Alexandria, VA 22313-1450

SIR:

PROPOSED NEW INDEPENDENT CLAIM

TRANSMITTED TO EXAMINER WOLLSCHLAGER VIA FACSIMILE

AUGUST 13, 2007

Proposed New Independent Claim:

Claim XX: A method of joining porous polymer  
workpieces comprising:

- a) applying a first polymerizable material to a first  
surface of a first porous polymer workpiece; and,
  - (i) causing said first polymerizable material to  
penetrate said first surface of said first porous

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- polymer workpiece, creating therein a first surface diffusion zone adjacent to said first surface; and,
- (ii) drying said first surface thereby removing any excess of said first polymerizable material; and,
- b) applying a second polymerizable material to a second surface of a second porous polymer workpiece; AND,
- (i) causing said second polymerizable material to penetrate said second surface of said second porous polymer workpiece, creating therein a second surface diffusion zone adjacent to said second surface; and,
- (ii) drying said second surface, thereby removing any excess of said second polymerizable material; and,
- c) bringing said first surface and said first surface diffusion zone adjacent thereto into intimate contact with said second surface and said second surface diffusion zone adjacent thereto creating a bonding interface; and,
- d) applying heat, pressure, radiation, or combinations thereof to said bonding interface, thereby causing said first polymerizable material and said second polymerizable material to react and join together across said bonding interface, thereby bonding said first porous polymer workpiece to said second porous polymer workpiece.

## Points of Discussion:

Unger (2001/0054778) relates to bonding of elastomeric structures in which bonding occurs through an excess of

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a component of the parent elastomer "such that reactive molecules remain at the surface" (Unger [0012])). In contrast to the present method of bonding in which excess polymerizable material(s) are explicitly removed from the surface before bonding.

Soane (6,176,962) likewise calls for bonding materials on the surface (ABST, col.2, l.53-57), direct thermal bonding of the materials themselves (col. 2, l. 58-col. 3, l. 9), the use of thermo-melting adhesives (col. 3, l. 13-22) and liquid curable materials (col. 3, l. 23-32). In contrast to the proposed claim having a drying step to remove bonding materials from the surface, Soane teaches a non-flowable layer of adhesive material on the surfaces to be bonded (col. 3, l. 26-31). Conventional adhesive layers inherently penetrate the articles to be bonded to a small extent, without which tight bonding could not result. However, none of the references teach the step of providing a dry surface prior to bonding, including an explicit drying step if the polymerizable materials do not inherently penetrate the material such that the surface becomes dry.

Following MPEP § 2143.03 that every claim limitation is essential, applicants respectfully submit that the dry surface claim limitation is not taught or suggested in the prior art.